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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/787,333 | DAWSON ET AL. | |
| | Examiner | Art Unit | |
| | KISHIN G. BELANI | 2143 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

This action is in response to Applicants' amendment filed on 12/26/2007. **No claims have been amended, added or cancelled. Claims 1-29 are now pending** in the present application. The applicants' arguments and the examiner's responses are shown in the section "Response to Arguments" at the end of this office action. **This Action is made FINAL.**

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness
   or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 6-8, 10, 12, 15, 19, 24, 25 and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1).**

Consider **claim 1**, Soltis shows and discloses a client apparatus for data access on a storage device connected to a storage area network (Fig. 4, Nasan Client 142, SAN-Attached Devices 126 and SAN 128; paragraph 0074 that discloses the components of a data access system using a file sharing environment; Fig. 5 shows the client apparatus 142 in more details), the apparatus comprising:
a first network interface configured to allow the apparatus to communicate with a storage server (Figs. 4 and 5, LAN 104 that allows the client 142 to communicate with NAS Storage Server 106; paragraph 0074 that discloses the same details);
a second network interface configured to allow the apparatus to communicate with a storage device on a storage area network (Figs. 4 and 5, SAN 128 that allows the client

142 to communicate with storage device 126 on a storage area network 128; paragraph 0074 that discloses the same details);

a storage management client configured to communicate with the storage server and coordinate use of the storage device (Fig. 5, Nasan File System 152 and its component Client-Side Remote File System 156 that together act as a storage management client configured to communicate with the storage server and coordinate use of the storage device; paragraphs 0082 and 0084 that disclose the same details).

However, Soltis does not explicitly disclose a metadata management module configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database on the storage server, the metadata associated with file data corresponding to a client.

In the same field of endeavor, Byrnes shows and discloses the claimed apparatus further comprising a metadata management module configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database on the storage server, the metadata associated with file data corresponding to a client (Fig. 1, System Management Service (SMS) 17, that includes a metadata management module (Distributed Metadata Service 15) configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata

database (100a-100n) on the storage server, the metadata associated with file data corresponding to a client; paragraphs 0025-0027 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a metadata management module configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database on the storage server, the metadata associated with file data corresponding to a client, as taught by Byrnes, in the apparatus of Soltis, so as to be able to manage computer resource usage more effectively.

Consider **claim 6**, and **as it applies to claim 1 above**, Soltis as modified by Byrnes, further shows and discloses the claimed apparatus, wherein the metadata comprises one of a file data characteristic, a device characteristic, a media characteristic, a positioning indicator, and an append position indicator (in Soltis reference, paragraph 0012, lines 4-6 that disclose metadata as being file system structure data that describes volume layout information, inodes, pointer blocks and allocation tables).

Consider **claim 7**, and **as it applies to claim 1 above**, Soltis as modified by Byrnes, further shows and discloses the claimed apparatus, further comprising a write module configured to write the file data to a storage device (in Soltis reference, Fig. 5, Nasan File System 152 acting as a write module; paragraph 0082, lines 3-8 and

paragraph 0084 that disclose the details of read and write request processing from a client 142, thereby disclosing the presence of a write module configured to write the file data to a storage device).

Consider **claim 8**, and **as it applies to claim 1 above**, Soltis as modified by Byrnes, further shows and discloses the claimed apparatus, further comprising a read module configured to read the file data from the storage device (in Soltis reference, Fig. 5, Nasan File System 152 acting as a read module; paragraph 0082, lines 3-8 and paragraph 0084 that disclose the details of read and write request processing from a client 142, thereby disclosing the presence of a read module configured to read the file data from the storage device).

Consider **claim 10**, Soltis shows and discloses a server apparatus for data access management on a storage device connected to a storage area network (Fig. 5, NAS Server 106 providing data access management on a storage device 126 connected to a storage area network SAN 128; paragraphs 0074 and 0075 that disclose the components of a data access system using a file sharing environment), the apparatus comprising:
a first network interface configured to allow the apparatus to communicate with a storage agent (Figs. 4 and 5, LAN 104 with interface 110, that allows the NAS server 106 to communicate with the client 142 via Nasan File System using Client-Side

Remote File System as a storage agent; paragraphs 0074 and 0075 that disclose the same details); and

a storage manager configured to manage a data access by the storage agent to a storage device (Fig. 5, Server-Side Remote File System 158 along with Local File System acting as a storage manager and configured to manage a data access (via broken-line arrows 148) by the storage agent to a storage device).

However, Soltis does not explicitly disclose a centralized metadata database configured to exclusively store at least a portion of metadata from the storage agent, the metadata associated with file data and received by the storage agent from a client via a data access request.

In the same field of endeavor, Byrnes shows and discloses the claimed apparatus further comprising a centralized metadata database configured to exclusively store at least a portion of metadata from the storage agent, the metadata associated with file data and received by the storage agent from a client via a data access request (Fig. 1, System Management Service (SMS) 17, that includes a metadata management module (Distributed Metadata Service 15) configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database (100a-100n) on the storage server, the metadata associated with file data corresponding to a client; paragraphs 0025-0027 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a centralized metadata database configured

to exclusively store at least a portion of metadata from the storage agent, the metadata associated with file data and received by the storage agent from a client via a data access request, as taught by Byrnes, in the server apparatus of Soltis, so as to be able to manage computer resource usage more effectively.

Consider **claim 12**, and **as it applies to claim 10 above**, Soltis as modified by Byrnes, further shows and discloses the claimed apparatus, comprising a second network interface configured to allow the apparatus to communicate with the storage device on the storage area network (in Soltis reference, Fig. 5, SAN Network 128 with interface 130 to NAS Server and to Storage Device 126; paragraph 0076, that disclose the details of a second network).

Consider **claim 15**, Soltis shows and discloses a system for data access management on a storage device connected to a storage area network (Fig. 5, Nasan Client(s) 142, LAN 104, NAS Server 106, SAN 128 and SAN-Attached Devices 126 that make up system 140 for data access management on a storage device connected to a storage area network; paragraphs 0074-0076 that describe the devices that make up system 140), the system comprising:
a first network configured to communicate network data (Fig. 5, Local Area Network 104 with communication interface 110 to Nasan Client 142 and NAS Server 106; paragraph 0074 that discloses the same details);

a second network configured to communicate file data between a node and a storage device (Fig. 5, Storage Area Network 128 with communication interface 130 to Nasan Client 142 and SAN-Attached Devices 126; paragraph 0076 that discloses the details about the SAN network 128);

a storage server connected to the first network, the storage server having a storage manager and a centralized metadata database, the storage server configured to manage a data access to the storage device (Fig. 5, NAS Server 106 connected to LAN 104, Server-Side Remote File System 158 and Local File System 155; paragraphs 0074-0076 disclose the same details); and

a client computer connected to the first and second networks (Fig. 5, Nasan Client 142 connected to LAN 104 and SAN 128; paragraph 0074 discloses the same details), the client computer having a storage management client (Fig. 5, Nasan File System 152 and Client-Side Remote File System 156 that function as a storage management module; paragraph 0082 that discloses the same details), the storage management client configured to communicate with the storage server and coordinate use of the storage device (Fig. 5, Nasan Client 142 in communication with NAS Server 106 via LAN interface 110 and to the SAN-Attached Devices 126, in order to coordinate the use of the storage devices 126).

However, Soltis does not explicitly disclose a metadata management module configured to minimize metadata processing on the client computer by communicating at least a portion of the metadata to the storage server to be exclusively stored in the centralized metadata database, the metadata associated with the file data.

In the same field of endeavor, Byrnes shows and discloses the claimed system further comprising a metadata management module configured to minimize metadata processing on the client computer by communicating at least a portion of the metadata to the storage server to be exclusively stored in the centralized metadata database, the metadata associated with the file data (Fig. 1, System Management Service (SMS) 17, that includes a metadata management module (Distributed Metadata Service 15) configured to minimize metadata processing on the client computer by communicating at least a portion of the metadata to the storage server to be exclusively stored in the centralized metadata database (100a-100n); paragraphs 0025-0027 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include a metadata management module configured to minimize metadata processing on the client computer by communicating at least a portion of the metadata to the storage server to be exclusively stored in the centralized metadata database, the metadata associated with the file data, as taught by Byrnes, in the system of Soltis, so as to be able to manage computer resource usage more effectively.

Consider **claim 19**, Soltis discloses a computer readable storage medium comprising computer readable code configured to carry out a method for data access management on a storage device connected to a storage area network (claim 1 that

claims client and server programming of the disclosed system of invention shown in Fig. 5), the method comprising:

receiving a data access request from a client (Fig. 5, client 142 request to write to a SAN-Attached Device 126 (shown by broken-line arrows 148) and client 142 request to read from a SAN-Attached Device 126 (shown by arrows 146); paragraph 0037 which discloses that SAN servers locate file data on SAN-Attached Devices by examining and modifying file metadata supplied by the client in a request; paragraph 0077 describes the read and write paths shown in Fig. 5), and

processing at least a portion of the metadata at a storage agent and accessing a storage device according to a volume management scheme (paragraph 0077 that discloses a primary read data-path 144 and a secondary read data-path 146 wherein the processing of metadata and access of file data from the storage device is performed by the client computer's storage agent software module).

However, Soltis does not explicitly disclose that a data access request includes metadata associated with file data corresponding to a client, and communicating the metadata to a storage server and exclusively storing at least a portion of the metadata in a centralized metadata database on the storage server.

In the same field of endeavor, Byrnes shows and discloses the claimed programming code, wherein a data access request includes metadata associated with file data corresponding to a client, and communicating the metadata to a storage server and exclusively storing at least a portion of the metadata in a centralized metadata database on the storage server (Fig. 1, System Management Service (SMS) 17, that

includes a metadata management module (Distributed Metadata Service 15) configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database (100a-100n) on the storage server, the metadata associated with file data corresponding to a client; paragraphs 0025-0027 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to process a data access request that includes metadata associated with file data corresponding to a client, and communicate the metadata to a storage server and exclusively store at least a portion of the metadata in a centralized metadata database on the storage server, as taught by Byrnes, in the computer readable storage medium of Soltis, so as to be able to manage computer resource usage more effectively.

Consider **claim 24**, and **as it applies to claim 19 above**, Soltis as modified by Byrnes, further discloses a computer readable storage medium, wherein the metadata comprises one of a file data characteristic, a device characteristic, a media characteristic, a positioning indicator, and an append position indicator (in Soltis reference, paragraph 0012, lines 4-6 that disclose metadata as being file system structure data that describes volume layout information, inodes, pointer blocks and allocation tables).

Consider **claim 25**, Soltis discloses a method for data access management on a storage device connected to a storage area network (Fig. 5, NAS Server 106 providing data access management on a storage device 126 connected to a storage area network SAN 128; paragraphs 0074 and 0075 that disclose the components of a data access system using a file sharing environment), the method comprising:
receiving a data access request from a client, the data access request including metadata associated with file data corresponding to a client (Fig. 5, client 142 request to write to a SAN-Attached Device 126 (shown by broken-line arrows 148) and client 142 request to read from a SAN-Attached Device 126 (shown by arrows 146); paragraph 0037 which discloses that SAN servers locate file data on SAN-Attached Devices by examining and modifying file metadata supplied by the client in a request; paragraph 0077 describes the read and write paths shown in Fig. 5); and
processing at least a portion of the metadata at a storage agent and accessing a storage device according to a volume management scheme (paragraph 0077 that discloses a primary read data-path 144 and a secondary read data-path 146 wherein the processing of metadata and access of file data from the storage device is performed by the client computer's storage agent software module).

However, Soltis does not explicitly disclose communicating the metadata to a storage server and exclusively storing at least a portion of the metadata in a centralized metadata database on the storage server.

In the same field of endeavor, Byrnes shows and discloses communicating the metadata to a storage server and exclusively storing at least a portion of the metadata

in a centralized metadata database on the storage server (Fig. 1, System Management Service (SMS) 17, that includes a metadata management module (Distributed Metadata Service 15) configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database (100a-100n) on the storage server, the metadata associated with file data corresponding to a client; paragraphs 0025-0027 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to communicate the metadata to a storage server and exclusively store at least a portion of the metadata in a centralized metadata database on the storage server, as taught by Byrnes, in the method of Soltis, so as to be able to manage computer resource usage more effectively.

Consider **claim 29**, Soltis discloses an apparatus for data access management on a storage device connected to a storage area network (Fig. 5, NAS Server 106 providing data access management on a storage device 126 connected to a storage area network SAN 128; paragraphs 0074 and 0075 that disclose the components of a data access system using a file sharing environment), the apparatus comprising: means for receiving a data access request from a client, the data access request including metadata associated with file data corresponding to a client (Fig. 5, client 142 request to write to a SAN-Attached Device 126 (shown by broken-line arrows 148) and client 142 request to read from a SAN-Attached Device 126 (shown by arrows 146);

paragraph 0037 which discloses that SAN servers locate file data on SAN-Attached Devices by examining and modifying file metadata supplied by the client in a request; paragraph 0077 describes the read and write paths shown in Fig. 5); and means for processing at least a portion of the metadata at a storage agent and accessing a storage device according to a volume management scheme (paragraph 0077 that discloses a primary read data-path 144 and a secondary read data-path 146 wherein the processing of metadata and access of file data from the storage device is performed by the client computer's storage agent software module).

However, Soltis does not explicitly disclose means for communicating the metadata to a storage server and exclusively storing at least a portion of the metadata in a centralized metadata database on the storage server.

In the same field of endeavor, Byrnes shows and discloses means for communicating the metadata to a storage server and exclusively storing at least a portion of the metadata in a centralized metadata database on the storage server (Fig. 1, System Management Service (SMS) 17, that includes a metadata management module (Distributed Metadata Service 15) configured to minimize metadata processing on the apparatus by communicating at least a portion of the metadata to the storage server to be exclusively stored in a centralized metadata database (100a-100n) on the storage server, the metadata associated with file data corresponding to a client; paragraphs 0025-0027 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means for communicating the metadata to a

storage server and exclusively storing at least a portion of the metadata in a centralized metadata database on the storage server, as taught by Byrnes, in the apparatus of Soltis, so as to be able to manage computer resource usage more effectively.

**Claims 2, 11 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **Nishanov et al. (U.S. Patent Application Publication # 2003/0065782 A1).**

Consider **claim 2**, and **as it applies to claim 1 above**, Soltis as modified by Byrnes, shows and discloses the claimed apparatus, except a volume management module configured to request exclusive access to a volume.

In the same field of endeavor, Nishanov et al. disclose a volume management module configured to request exclusive access to a volume (Abstract; Fig. 1, Host Adapter 197 acting as a volume management module and Storage Devices 198 that include storage volumes; paragraph 0035 that discloses request for exclusive access to a storage volume).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a volume management module configured to request exclusive access to a volume, as taught by Nishanov et al. in the apparatus of Soltis, as modified by Byrnes, so as to be able to lock the usage of the same data by

other users, while the current user request is being processed, so that no corruption of the accessed data occurs.

Consider **claim 11**, and **as it applies to claim 10 above**, Soltis as modified by Byrnes, shows and discloses the claimed server apparatus, except wherein the storage manager is further configured to manage the data access by the storage agent to a volume in response to a volume access request from the storage agent.

In the same field of endeavor, Nishanov et al. disclose that the storage manager is further configured to manage the data access by the storage agent to a volume in response to a volume access request from the storage agent (Fig. 1, Host Adapter 197 acting as a volume management module and Storage Devices 198 that include storage volumes; paragraph 0033 that discloses details of managing the data access by the storage agent to a volume in response to a volume access request from the storage agent).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a storage manager configured to manage the data access by the storage agent to a volume in response to a volume access request from the storage agent, as taught by Nishanov et al. in the server apparatus of Soltis, as modified by Byrnes, so as to be able to manage access to storage devices in a shared file system.

Consider **claim 16**, and **as it applies to claim 15 above**, Soltis as modified by Byrnes, shows and discloses the claimed system, except wherein the client computer further comprises a volume management module configured to request exclusive access to a volume.

In the same field of endeavor, Nishanov et al. disclose a volume management module configured to request exclusive access to a volume (Abstract; Fig. 1, Host Adapter 197 acting as a volume management module and Storage Devices 198 that include storage volumes; paragraph 0035 that discloses request for exclusive access to a storage volume).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a volume management module configured to request exclusive access to a volume, as taught by Nishanov et al. in the system of Soltis, as modified by Byrnes, so as to be able to lock the usage of the same data by other users, while the current user request is being processed, so that no corruption of the accessed data occurs.

**Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **Nishanov et al. (U.S. Patent Application Publication # 2003/0065782 A1),** and further in view of **Collins et al. (U.S. Patent Application Publication # 2002/0188733 A1).**

Consider **claim 3**, and **as it applies to claim 2 above**, Soltis as modified by Byrnes and Nishanov et al., shows and discloses the claimed apparatus, except wherein the volume management module is further configured to request priority access to the volume.

In the same field of endeavor, Collins et al. disclose that the volume management module is further configured to request priority access to the volume (Fig. 4, Priority 320 in the Usage Policy table 250; paragraph 0035 that describes the usage policy and the corresponding priorities associated with access to NAS devices; paragraph 0053 further discloses priorities for access for a particular user or terminal).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a volume management module which is further configured to request priority access to the volume, as taught by Collins et al. in the apparatus of Soltis, as modified by Byrnes and Nishanov et al., so as to be able to process service requests from different types of users (such as administrators, other users etc.) based on priority levels assigned to them.

**Claims 4 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **Nishanov et al. (U.S. Patent Application Publication # 2003/0065782 A1),** and further in view of **Porter et al. (U.S. Patent Application Publication # 2005/0123122 A1).**

Consider **claim 4**, and **as it applies to claim 2 above**, Soltis as modified by Byrnes and Nishanov et al., shows and discloses the claimed apparatus, except wherein the volume management module is further configured to terminate the data access on the storage device in response to a preemption notification from the storage server.

In the same field of endeavor, Porter et al. disclose the claimed apparatus wherein the volume management module is further configured to terminate the data access on the storage device in response to a preemption notification from the storage server (paragraph 0015, lines 3-10 which disclose that the resource manager (volume management module) may de-allocate a previously allocated resource in response to a preemption notification from the storage server in order to process a higher priority request).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means wherein the volume management module is further configured to terminate the data access on the storage device in response to a preemption notification from the storage server, as taught by Porter et al. in the apparatus of Soltis, as modified by Byrnes and Nishanov et al., so as to be able to process a service request of a higher priority (such as administrators etc.).

Consider **claim 5**, and **as it applies to claim 2 above**, Soltis as modified by Byrnes and Nishanov et al., shows and discloses the claimed apparatus, except

wherein the volume management module is further configured to send a volume termination notification to notify the storage server in response to a completed data access operation.

In the same field of endeavor, Porter et al. disclose the claimed apparatus wherein the volume management module is further configured to send a volume termination notification to notify the storage server in response to a completed data access operation (flowchart of Fig. 4B, blocks 51 and 53; paragraph 0034, lines 19-25 which disclose that if a resource for a service is to be released (upon completion of a service), a resource release message is sent to the resource manager (volume management module).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means the volume management module is further configured to send a volume termination notification to notify the storage server in response to a completed data access operation, as taught by Porter et al. in the apparatus of Soltis, as modified by Byrnes and Nishanov et al., so as to free up the allocated resources for use by other service requests.

**Claims 9, 17, 21 and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **O'Toole, Jr. et al. (U.S. Patent Publication # 7,254,636 B1).**

Consider **claim 9**, and **as it applies to claim 1 above**, Soltis as modified by Byrnes, shows and discloses the claimed apparatus, except further comprising a failover module configured to communicate the file data to the storage server in response to a data access failure.

In the same field of endeavor, O'Toole, Jr. et al. disclose a failover module configured to communicate the file data to the storage server in response to a data access failure (flowchart of Fig. 7, block 570 and Fig. 9 that disclose the detailed processing of read and write requests in case of a failover; column 14, lines 12-17 and column 15, lines 50-67 and column 16, lines 1-53 that disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a failover module configured to communicate the file data to the storage server in response to a data access failure, as taught by O'Toole, Jr. et al. in the apparatus of Soltis, as modified by Byrnes, so as to provide a reliable means of processing service requests in the event of a failure in the primary system.

Consider **claim 17**, and **as it applies to claim 15 above**, Soltis as modified by Byrnes, shows and discloses the claimed apparatus, except wherein the client computer further comprises a failover module configured to communicate the file data to the storage server in response to a data access failure.

In the same field of endeavor, O'Toole, Jr. et al. disclose a failover module configured to communicate the file data to the storage server in response to a data

access failure (flowchart of Fig. 7, block 570 and Fig. 9 that disclose the detailed processing of read and write requests in case of a failover; column 14, lines 12-17 and column 15, lines 50-67 and column 16, lines 1-53 that disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a failover module configured to communicate the file data to the storage server in response to a data access failure, as taught by O'Toole, Jr. et al. in the apparatus of Soltis, as modified by Byrnes, so as to provide a reliable means of processing service requests in the event of a failure in the primary system.

Consider **claim 21**, and **as it applies to claim 19 above**, Soltis as modified by Byrnes, shows and discloses the claimed computer readable storage medium, except communicating the file data to the storage server in response to a data access failure.

In the same field of endeavor, O'Toole, Jr. et al. disclose communicating the file data to the storage server in response to a data access failure (claim 44; Abstract that disclose a filer proxy which accepts a client request and translates the request to a file transfer protocol and, in addition, generates a file handle for the file containing redundant filer proxy to be used in case of failover to a backup filer proxy; Fig. 3 shows the server message generated by the filer proxy in response to a request for data access from a client; column 10, lines 50-67 and column 11, lines 1-8 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means for communicating file data to the storage server in response to a data access failure, as taught by O'Toole, Jr. et al. in the computer readable storage medium of Soltis, as modified by Byrnes, so as to provide a reliable means of processing service requests using alternate means in the event of a failure in the primary path.

Consider **claim 27**, and **as it applies to claim 25 above**, Soltis as modified by Byrnes, shows and discloses the claimed method, except communicating the file data to the storage server in response to a data access failure.

In the same field of endeavor, O'Toole, Jr. et al. disclose communicating the file data to the storage server in response to a data access failure (claim 44; Abstract that disclose a filer proxy which accepts a client request and translates the request to a file transfer protocol and, in addition, generates a file handle for the file containing redundant filer proxy to be used in case of failover to a backup filer proxy; Fig. 3 shows the server message generated by the filer proxy in response to a request for data access from a client; column 10, lines 50-67 and column 11, lines 1-8 disclose the same details).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means for communicating file data to the storage server in response to a data access failure, as taught by O'Toole, Jr. et al. in the method of Soltis, as modified by Byrnes, so as to provide a reliable means of

processing service requests using alternate means in the event of a failure in the primary path.

**Claims 13 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **Porter et al. (U.S. Patent Application Publication # 2005/0123122 A1).**

Consider **claim 13**, and **as it applies to claim 10 above**, Soltis as modified by Byrnes, shows and discloses the claimed server apparatus, except wherein the storage manager is further configured to preempt use of a volume by a non-priority storage agent in response to the volume access request from a priority storage agent.

In the same field of endeavor, Porter et al. disclose the claimed apparatus wherein the storage manager is further configured to preempt use of a volume by a non-priority storage agent in response to the volume access request from a priority storage agent (paragraph 0015, lines 3-10 which disclose that the resource manager may preempt use of a volume by a non-priority storage agent in response to the volume access request from a priority storage agent).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means wherein the storage manager may preempt use of a volume by a non-priority storage agent in response to the volume access request from a priority storage agent, as taught by Porter et al. in the apparatus

of Soltis, as modified by Byrnes, so as to be able to process a service request of a higher priority (such as administrators etc.).

Consider **claim 23**, and **as it applies to claim 19 above**, Soltis as modified by Byrnes, shows and discloses the claimed invention, except wherein a computer readable storage medium further comprises preempting use of a volume by a non-priority storage agent in response to a volume access request from a priority storage agent.

In the same field of endeavor, Porter et al. disclose the claimed invention, wherein a computer readable storage medium further comprises preempting use of a volume by a non-priority storage agent in response to a volume access request from a priority storage agent (paragraph 0015, lines 3-10 which disclose that the resource manager (volume management module) may de-allocate a previously allocated resource in response to a preemption notification from the storage server in order to process a higher priority request from the client computer).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means wherein a computer readable storage medium further comprises preempting use of a volume by a non-priority storage agent in response to a volume access request from a priority storage agent, as taught by Porter et al. in the computer readable storage medium of Soltis, as modified by Byrnes, so as to be able to process a service request of a higher priority (such as administrators etc.).

**Claims 14, 18, 22 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **Coates et al. (U.S. Patent Publication # 7,952,737 B1).**

Consider **claim 14**, and **as it applies to claim 10 above**, Soltis as modified by Byrnes, shows and discloses the claimed server apparatus, except wherein the storage manager is further configured to update the centralized metadata database with new metadata in response to receiving the new metadata from the storage agent.

In the same field of endeavor, Coates et al. disclose the claimed server apparatus wherein the storage manager is further configured to update the centralized metadata database with new metadata in response to receiving the new metadata from the storage agent (Fig. 6 that shows DOSM (Distributed Object Storage Manager) Server 600 (server apparatus); Fig. 3 that shows Distributed Object Storage Managers 320 managing Storage Nodes 340; flowchart of Fig. 13B, decision blocks 1386 and 1392 that test for folder/file update requests from the client (storage agent) ; column 6, lines 62- 66 that disclose a Distributed Object Storage Manager (DOSM) being implemented in software for execution on server 600; column 16, lines 62-67 and column 17, lines 1-3 that disclose updates to metadata database in response to receiving the new metadata from the storage agent).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means wherein the storage manager is further configured to update the centralized metadata database with new metadata in response to receiving the new metadata from the storage agent, as taught by Coates et al. in the apparatus of Soltis, as modified by Byrnes, so as to maintain proper correspondence between the file data and its associated metadata, whenever the file data is updated.

Consider **claim 18**, and **as it applies to claim 15 above**, Soltis as modified by Byrnes, shows and discloses the claimed server apparatus, except wherein the client computer is further configured to communicate new metadata to the storage server in response to a data access operation, and the storage server is further configured to update the centralized metadata database with the new metadata in response to receiving the new metadata from the storage agent.

In the same field of endeavor, Coates et al. disclose the claimed server apparatus wherein the client computer is further configured to communicate new metadata to the storage server in response to a data access operation, and the storage server is further configured to update the centralized metadata database with the new metadata in response to receiving the new metadata from the storage agent (Fig. 6 that shows DOSM (Distributed Object Storage Manager) Server 600 (server apparatus); Fig. 3 that shows Distributed Object Storage Managers 320 managing Storage Nodes 340; flowchart of Fig. 13B, decision blocks 1386 and 1392 that test for folder/file update

requests from the client (storage agent) ; column 6, lines 62- 66 that disclose a Distributed Object Storage Manager (DOSM) being implemented in software for execution on server 600; column 16, lines 62-67 and column 17, lines 1-3 that disclose updates to metadata database in response to receiving the new metadata from the storage agent).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means wherein the client computer is further configured to communicate new metadata to the storage server in response to a data access operation, and the storage server is further configured to update the centralized metadata database with the new metadata in response to receiving the new metadata from the storage agent, as taught by Coates et al. in the apparatus of Soltis, as modified by Byrnes, so as to maintain proper correspondence between the file data and its associated metadata, whenever the file data is updated.

Consider **claim 22**, and **as it applies to claim 19 above**, Soltis as modified by Byrnes, discloses the claimed computer readable storage medium, except wherein the method further comprises communicating new metadata to the storage server in response to a data access operation and updating the centralized metadata database with the new metadata in response to receiving the new metadata.

In the same field of endeavor, Coates et al. disclose the claimed computer readable storage medium, except wherein the method is further configured to communicate new metadata to the storage server in response to a data access

operation, and the storage server is further configured to update the centralized metadata database with the new metadata in response to receiving the new metadata from the storage agent (Fig. 6 that shows DOSM (Distributed Object Storage Manager) Server 600 (server apparatus); Fig. 3 that shows Distributed Object Storage Managers 320 managing Storage Nodes 340; flowchart of Fig. 13B, decision blocks 1386 and 1392 that test for folder/file update requests from the client (storage agent) ; column 6, lines 62- 66 that disclose a Distributed Object Storage Manager (DOSM) being implemented in software for execution on server 600; column 16, lines 62-67 and column 17, lines 1-3 that disclose updates to metadata database in response to receiving the new metadata from the storage agent).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide means wherein the client computer is further configured to communicate new metadata to the storage server in response to a data access operation, and the storage server is further configured to update the centralized metadata database with the new metadata in response to receiving the new metadata from the storage agent, as taught by Coates et al. in the apparatus of Soltis, as modified by Byrnes, so as to maintain proper correspondence between the file data and its associated metadata, whenever the file data is updated.

Consider **claim 28**, and **as it applies to claim 25 above**, Soltis as modified by Byrnes, discloses the claimed method, except communicating new metadata to the

storage server in response to a data access operation and updating the centralized metadata database with the new metadata in response to receiving the new metadata.

In the same field of endeavor, Coates et al. disclose the claimed method, communicating new metadata to the storage server in response to a data access operation and updating the centralized metadata database with the new metadata in response to receiving the new metadata (Fig. 6 that shows DOSM (Distributed Object Storage Manager) Server 600 (server apparatus); Fig. 3 that shows Distributed Object Storage Managers 320 managing Storage Nodes 340; flowchart of Fig. 13B, decision blocks 1386 and 1392 that test for folder/file update requests from the client (storage agent) ; column 6, lines 62- 66 that disclose a Distributed Object Storage Manager (DOSM) being implemented in software for execution on server 600; column 16, lines 62-67 and column 17, lines 1-3 that disclose updates to metadata database in response to receiving the new metadata from the storage agent).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to communicate new metadata to the storage server in response to a data access operation and updating the centralized metadata database with the new metadata in response to receiving the new metadata, as taught by Coates et al. in the method of Soltis, as modified by Byrnes, so as to maintain proper correspondence between the file data and its associated metadata, whenever the file data is updated.

**Claims 20 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Soltis (US Patent Application Publication # 2007/0094354 A1),** in view of **Byrnes (U.S. Patent Application Publication # 2005/0138162 A1),** and further in view of **Collins et al. (U.S. Patent Application Publication # 2002/0188733 A1).**

Consider **claim 20**, and **as it applies to claim 19 above**, Soltis as modified by Byrnes, discloses the claimed computer readable storage medium, except wherein the method further comprises the managing data access by the storage agent to a storage device.

In the same field of endeavor, Collins et al. disclose the claimed computer readable storage medium, wherein the method further comprises the managing data access by the storage agent to a storage device (in Collins et al. reference, paragraph 0008, lines 1-9 which disclose that a software agent (storage agent) may prioritize a transaction at the network storage device based on the usage policy, thereby disclosing management of data access by the storage agent to a storage device).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide management of data access by the storage agent to a storage device, as taught by Collins et al. in the computer readable storage medium of Soltis, as modified by Byrnes, so as to maintain access control and prioritize data access requests from the clients.

Consider **claim 26**, and **as it applies to claim 25 above**, Soltis as modified by Byrnes, discloses the claimed method, except managing data access by the storage agent to a storage device.

In the same field of endeavor, Collins et al. disclose the claimed method, further comprising managing data access by the storage agent to a storage device (in Collins et al. reference, paragraph 0008, lines 1-9 which disclose that a software agent (storage agent) may prioritize a transaction at the network storage device based on the usage policy, thereby disclosing management of data access by the storage agent to a storage device).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide management of data access by the storage agent to a storage device, as taught by Collins et al. in the method of Soltis, as modified by Byrnes, so as to maintain access control and prioritize data access requests from the clients.

***Response to Arguments***

Applicants' arguments with respect to **claims 1-29** have been considered but are not persuasive. Therefore the **rejections of Claims 1-29 are maintained.**

Consider **independent claims 1, 10, 15, 19, 25 and 29**. The applicants' basis for argument against rejection of these claims states that the cited reference of Byrnes (U.S. Application Publication # 2005/0138162) teaches a scalable distributed Metadata Service (MDS) 15, which being distributed over a plurality of devices, cannot possibly

store metadata exclusively in a centralized metadata database. The examiner respectfully disagrees with this interpretation of the applicants. The claim language clearly states **"at least a portion of the metadata to be exclusively stored in a centralized metadata database", not the entire metadata.** So, even if the disclosed MDS is distributed, it is quite capable of exclusively storing **at least a portion** of the metadata in a centralized metadata database 100a as shown in Fig. 1. Furthermore, paragraph 0026 of Byrnes reference discloses that a metadata partition cannot belong to more than one file system, which is a hierarchical representation ("tree") of files, directories and devices on a single physical server with a specified "root". As such in Byrnes apparatus, metadata associated with file data corresponding to a client cannot be distributed across multiple servers, as alleged by the applicants. Additionally, paragraph 0027 teaches that each metadata partition (84a-84n) is made up of an MDS Server (101a-101n) and an MDS database (100a-100n), thereby disclosing a centralized metadata database. The examiner therefore disagrees with the applicants' argument and **maintains the rejection for the independent claims 1, 10, 15, 19, 25 and 29 as well as their dependent claims.** As such, **all claims 1-29 remain rejected**.

***Conclusion***

**THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Art Unit: 2143

**Hand-delivered responses** should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Kishin G. Belani whose telephone number is (571) 270-1768. The Examiner can normally be reached on Monday-Thursday from 6:30 am to 5:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-0800.

*Kishin G. Belani*

K.G.B./kgb

March 30, 2008

/Kenny S Lin/
Primary Examiner, Art Unit 2152